

IN THE CLAIMS

What is claimed is:

1. (Currently amended) A method of automated graphics generation in response to a user request comprising:

determining a measure of similarity between the user request and one or more stored ~~graphics~~ graphical examples to measure whether the one or more stored graphical examples are adequate for creating one or more new graphical illustrations in accordance with the user request;

systematically decomposing the user request into sub-requests and the one or more stored graphical examples into graphical fragments in accordance with at least one of syntactic, semantic and pragmatic characteristics of the one or more graphical examples, if the user request and the one or more stored graphical examples are inadequately similar;

searching for at least one of at least one matching graphical example and at least one graphical fragment among the one or more graphical examples for the user request; and

~~obtaining at least one stored graphics example based on the similarity measure; and~~

composing ~~creating graphics~~ the one or more new graphical illustrations from at least one of the at least one ~~obtained graphics~~ graphical example and the at least one graphical fragment, using a pattern-based composition;

wherein the determining, decomposing, searching and composing steps utilize a cooperative critiquing technique between a user and a system for automated graphics generation.

2. (Currently amended) The method of claim 1, wherein the step of determining a measure of similarity further comprising comprises the step of:

determining one or more adequacy criteria to measure whether the one or more stored graphical examples are adequate.

~~determining whether the at least one obtained graphics example can be used for synthesizing graphics in accordance with the user request;~~

~~creating graphics when the at least one obtained graphics example can be used for synthesizing graphics in accordance with the user request;~~

~~decomposing the user request into a set of sub-requests when at least one obtained graphics example cannot be used for synthesizing graphics in accordance with the user request; and repeating the graphics generation method using the set of sub-requests.~~

3. (Currently amended) The method of claim 2, wherein determining whether the at least one obtained graphics graphical example is adequate ~~can be used for synthesizing graphics~~ comprises the steps of:

~~determining whether each graphics example produces a match for data nodes in the user request;~~

determining whether important data is better represented in the graphics than less important data; and

determining whether every data ~~leaf node~~ instance in the user request has acquired a visual candidate so that graphics ~~can be~~ are capable of being synthesized; and

determining whether the one or more graphical examples can be instantiated using data in the user request.

4. (Canceled)

5. (Currently amended) The method of claim 1 4, wherein the step of systematically decomposing at least one graphics graphical example comprises the steps of: extracting independent visual structures.

extracting independent visual structures;

removing decorations;

extracting leaf nodes to form a visual dictionary; and

dividing by data relations.

6. (Currently amended) The method of claim 1 4, wherein decomposing at least one ~~graphics~~ graphical example comprises ~~removing decorations~~ using user-provided decomposition instructions that are at least one of provided by the user interactively during runtime or pre-stored in the system.

7. (Canceled)

8. (Original) The method of claim 1 4, wherein the step of systematically decomposing at least one ~~graphics~~ graphical example comprises the steps of: dividing by data relations; decomposing the user request based on data relations; decomposing a user request based on data groupings; decomposing a user request based on tasks and subtasks; and dynamically extracting fragments that failed to obtain a match during a case-based retrieval process.

9. (Canceled)

10. (Original) The method of claim 1, further comprising providing user feedback while computing similarity measurements.

11. (Original) The method of claim 1, further comprising providing user feedback while creating graphics.

12. (Currently amended) The method of claim 1, wherein obtaining at least one stored ~~graphics~~ graphical example comprises:

arranging stored ~~graphics~~ graphical examples into hierarchical clusters according to each computed similarity measurement;

searching a cluster at a highest hierarchical level most likely to contain a top-matched ~~graphics~~ graphical example having the greatest similarity measurement to the user request;

determining a measure of similarity between the user request and each ~~graphics~~ graphical example within the searched cluster; and

outputting at least one ~~graphics~~ graphical example of the searched cluster having the greatest similarity measurement.

13. (Currently amended) The method of claim 12, further comprising:
determining whether the searched cluster has no clusters inside it; and
repeating the method of obtaining at least one stored ~~graphics~~ graphical example with clusters at a highest hierarchical level inside the searched cluster, if there are clusters inside the searched cluster, until a cluster having no clusters inside it is found.

14. (Currently amended) The method of claim 12, wherein searching a cluster comprises:
selecting a representative ~~graphics~~ graphical example from each cluster at the highest hierarchical level using an approximation; and
selecting the cluster having the representative ~~graphics~~ graphical example with the greatest similarity measurement to the user request.

15. (Currently amended) The method of claim 14, wherein the approximation uses meta properties of the stored ~~graphics~~ graphical examples.

16. (Currently amended) The method of claim 1, wherein creating graphics from at least one obtained ~~graphics~~ graphical example comprises:
extracting at least one composition pattern from the database;
generalizing the at least one composition pattern;
determining whether at least one new composition is valid using at least one generalized composition pattern; and
selecting the most probable valid composition.

17. (Original) The method of claim 16, further comprising:
generalizing at least one negative composition pattern; and
determining whether at least one new composition is invalid using at least one generalized negative composition pattern.

18. (Original) The method of claim 1, wherein creating a new sketch comprises inferring visual decorations.

19. (Currently amended) Apparatus for automatically generating graphics from a user request, the apparatus comprising:

a memory; and

at least one processor coupled to the memory and operative to: (i) determine a measure of similarity between the user request and one or more stored ~~graphics~~ graphical examples to measure whether the one or more stored graphical examples are adequate for creating one or more new graphical illustrations in accordance with the user request; (ii) systematically decompose the user request into sub-requests and the one or more stored graphical examples into graphical fragments in accordance with at least one of syntactic, semantic and pragmatic characteristics of the one or more graphical examples, if the user request and the one or more stored graphical examples are inadequately similar; (iii) search for at least one of at least one matching graphical example and at least one graphical fragment among the one or more graphical examples for the user request; and (ii) obtain at least one stored ~~graphics~~ example based on the similarity measure; and (iv) compose creating ~~graphics~~ the one or more new graphical illustrations from at least one of the at least one obtained ~~graphics~~ graphical example and the at least one graphical fragment, using a pattern-based composition; wherein the determining, decomposing, searching and composing steps utilize a cooperative critiquing technique between a user and a system for automated graphics generation.

20. (Currently amended) The apparatus of claim 19, wherein the processor is further operative to:

determine one or more adequacy criteria to measure whether the one or more stored graphical examples are adequate.

~~determine whether the at least one obtained graphics example can be used for synthesizing graphics in accordance with the user request;~~

~~create graphics when the at least one obtained graphics example can be used for synthesizing graphics in accordance with the user request;~~

~~decompose the user request into a set of sub-requests when at least one obtained graphics example cannot be used for synthesizing graphics in accordance with the user request; and~~

~~repeat the graphics generation method using the set of sub-requests.~~

21. (Currently amended) The apparatus of claim 20, wherein ~~the operation of~~ determining whether the at least one ~~obtained graphics graphical~~ example ~~can be~~ is adequate used for synthesizing graphics comprises the operations of:

~~determining whether each graphics example produces a match for data nodes in the user request;~~

determining whether important data is better represented in the graphics than less important data; and

determining whether every data ~~leaf node~~ instance in the user request has acquired a visual candidate so that graphics ~~can be~~ are capable of being synthesized; and

determining whether the one or more graphical examples can be instantiated using data in the user request.

22. (Canceled)

23. (Currently amended) The apparatus of claim 19 22, wherein ~~the operation of~~ systematically decomposing at least one ~~graphics graphical~~ example comprises: ~~the operation of~~ extracting independent visual structures;

extracting independent visual structures;

removing decorations;

extracting leaf nodes to form a visual dictionary; and

dividing by data relations.

24. (Currently amended) The apparatus of claim 19 22, wherein ~~the operation of~~ decomposing at least one ~~graphics graphical~~ example comprises ~~the operation of removing~~ decorations using user-provided decomposition instructions that are at least one provided by the user interactively during runtime or pre-stored in the system.

25. (Canceled)

26. (Currently amended) The apparatus of claim 19 22, wherein ~~the operation of~~ decomposing at least one ~~graphics graphical~~ example comprises: ~~the operation of dividing by data~~ relations.

decomposing the user request based on data relations;

decomposing the user request based on data groupings;

decomposing the user request based on tasks and subtasks; and

dynamically extracting fragments that failed to obtain a match during a case-based retrieval process.

27. (Canceled)

28. (Original) The apparatus of claim 19, wherein the processor is further operative to provide user feedback while computing similarity measurements.

29. (Original) The apparatus of claim 19, wherein the processor is further operative to provide user feedback while creating graphics.

30. (Currently amended) The apparatus of claim 19, wherein the ~~operation of~~ obtaining at least one stored ~~graphics~~ graphical example comprises the operations of:

arranging stored ~~graphics~~ graphical examples into hierarchical clusters according to each computed similarity measurement;

searching a cluster at a highest hierarchical level most likely to contain a top-matched ~~graphics~~ graphical example having the greatest similarity measurement to the user request;

determining a measure of similarity between the user request and each ~~graphics~~ graphical example within the searched cluster; and

outputting at least one ~~graphics~~ graphical example of the searched cluster having the greatest similarity measurement.

31. (Currently amended) The apparatus of claim 29, further comprising the operations of:

determining whether the searched cluster has no clusters inside it; and

repeating the method of obtaining at least one stored ~~graphics~~ graphical example with clusters at a highest hierarchical level inside the searched cluster, if there are clusters inside the searched cluster, until a cluster having no clusters inside it is found.

32. (Currently amended) The apparatus of claim 29, wherein the ~~operation of~~ searching a cluster comprises the operations of:

selecting a representative ~~graphics~~ graphical example from each cluster at the highest hierarchical level using an approximation; and

selecting the cluster having the representative ~~graphics~~ graphical example with the greatest similarity measurement to the user request.

33. (Currently amended) The apparatus of claim 32, wherein the approximation uses meta properties of the stored ~~graphics~~ graphical examples.

34. (Currently amended) The apparatus of claim 19, wherein the ~~operation of~~ creating graphics from at least one obtained ~~graphics~~ graphical example comprises the operations of:

- extracting at least one composition pattern from the database;
- generalizing the at least one composition pattern;
- determining whether at least one new composition is valid using at least one generalized composition pattern; and
- selecting the most probable valid composition.

35. (Original) The apparatus of claim 34, further comprising the operations of:

- generalizing at least one negative composition pattern; and
- determining whether at least one new composition is invalid using at least one generalized negative composition pattern.

36. (Currently amended) The apparatus of claim 19, wherein the ~~operation of~~ creating a new sketch comprises the operation of inferring visual decorations.

37. (Currently amended) An article of manufacture for automatically generating graphics from a user request, comprising a machine readable medium containing one or more programs which when executed implements:

- determining a measure of similarity between the user request and one or more stored ~~graphics~~ graphical examples to measure whether the one or more stored graphical examples are adequate for creating one or more new graphical illustrations in accordance with the user request;
- systematically decomposing the user request into sub-requests and the one or more stored graphical examples into graphical fragments in accordance with at least one of syntactic, semantic

and pragmatic characteristics of the one or more graphical examples, if the user request and the one or more stored graphical examples are inadequately similar;

searching for at least one of at least one matching graphical example and at least one graphical fragment among the one or more graphical examples for the user request; and

obtaining at least one stored graphics example based on the similarity measure; and

composing creating graphics the one or more new graphical illustrations from at least one of the at least one obtained graphics graphical example and the at least one graphical fragment, using a pattern-based composition;

wherein the determining, decomposing, searching and composing steps utilize a cooperative critiquing technique between a user and a system for automated graphics generation.